XVPX-6300
Single-Slot VPX
Intel® Core™ i7 Processor Module

USER'S MANUAL

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Associated Documents
Due to the complexity of some of the parts used on the XVPX-6300, it is not possible to include all of the detailed data on all such devices in this manual. A list of the specifications and data sheets that provide additional information is as follows:
VPX Standards, VITA 46.0, VITA 46.6, VITA 65.0, http://www.vita.com
PLX http://www.plx.com

WARNING
This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Warning for European Users – Electromagnetic Compatibility
European Union Directive 89/336/EEC requires that this apparatus comply with relevant ITE EMC standards. EMC compliance demands that this apparatus is installed within a VPX enclosure designed to contain electromagnetic radiation and which will provide protection for the apparatus with regard to electromagnetic immunity. This enclosure must be fully shielded. An example of such an enclosure is a Schroff® 7U EMC-RFI VPX System chassis, which includes a front cover to complete the enclosure.

The connection of non-shielded equipment interface cables to this equipment will invalidate European Free Trade Area (EFTA) EMC compliance and may result in electromagnetic interference and/or susceptibility levels that are in violation of regulations which apply to the legal operation of this device. It is the responsibility of the system integrator and/or user to apply the following directions, as well as those in the user manual, which relate to installation and configuration:

All interface cables should be shielded, both inside and outside of the VPX enclosure. Braid/foil type shields are recommended for serial, parallel and SCSI interface cables. Where as external mouse cables are not generally shielded, an internal mouse interface cable must either be shielded or looped (1 turn) through a ferrite bead at the enclosure point of exit (bulkhead connector). External cable connectors must be metal with metal back-shells and provide 360-degree protection about the interface wires. The cable shield must be terminated directly to the metal connector shell; shield ground drain wires alone are not adequate. VPX panel mount connectors that provide interface to external cables (e.g., RS232, USB, keyboard, mouse, etc.) must have metal housings and provide direct connection to the metal VPX chassis. Connector ground drain wires are not adequate.

Environmental Protection Statement
This product has been manufactured to satisfy environmental protection requirements where possible. Many of the components used (structural parts, printed circuit boards, connectors, batteries, etc.) are capable of being recycled. Final disposition of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

REVISION	DESCRIPTION	DATE
A	Initial Release	6/10
B	Edits	9/11
E	Updated PCB artwork and made numerous changes	4/12
E1	Added warning about option ROM usage on FAT PIPE B. Added testing conditions for temperature specifications.	9/12

Note

This VPX Single Slot Intel Core i7 Processor Modules designed to be used in a VPX backplane that supports module profiles MOD3-PAY-2F2T-16.2.5-3 or MOD3-PAY-2F2U-16.2.5-3. Use of this module in any other backplane profile could result in damage to this module or others in the chassis.

Technical Support

In the unlikely event that you experience problems with your product, contact Technical Support. Please be prepared to provide contact information and details of your problem. You may be asked for further details when calling:

TELEPHONE 248-295-0885
FAX 248-624-9234

Support may also be obtained via email
E-mail to xembedded@acromag.com

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Chapter 1 – Introduction

Module Features

The XVPX-6300 offers the following features:

- Intel® Core™ i7 Processor. Available models are all dual-core: i7-610E at 2.53GHz, i7-620LE at 2GHz and i7-620UE at 1.06GHz.
- 4GB of DDR3 SDRAM running at 1033MHz (610E, 620LE) or 800MHz (620UE).
- Four channels of SATA-300 out the P1 and P2 rear connectors. Use the XVPX-9630 to provide the connectors needed to connect external SATA drives.
- Quad Gigabit Ethernet controller with
    - One 10/100/1000BaseT port out the front panel RJ-45 connector
    - One 10/100/1000BaseT port out the P1 to support rear Ethernet (supports VITA 46.6)
    - Either a second 10/100/1000BaseT port out the P1 (Profile A), or two 1000BaseBX ports out the P1 (Profile B) (Both profiles support VITA 46.6)
- Two PCIe x4 connections to the VPX backplane (Fat Pipe A and Fat Pipe B)
- Three serial ports:
    - Two switchable RS-232/RS-422/RS-485 serial ports (Com 1 & 2) on P2
    - One RS-232 serial port on front panel (Com 4)
- Six Universal Serial Bus (USB 2.0) ports:
    - Two on front panel connector
    - Four out the P1and P2 rear connectors.
- Front panel RESET switch with indicating lights. Red for “fail” and green for “pass”.
- Ejector type handles in IEEE 1101.10 (CompactPCI type).
- Conduction cooled models available supporting -40C to 85C operational temperature range.
- Stereo audio line-in and line-out on P2 rear connector.
- VGA switchable between front panel and P2 connector.
- DVI-D on P2 rear connector.

Module and Backplane Profiles

This VPX Single Slot Intel Core i7 Processor Modules designed to be used in a VPX backplane that supports module profiles MOD3-PAY-2F2T-16.2.5-3 or MOD3-PAY-2F2U-16.2.5-3. Use of this module in any other backplane profile could result in damage to this module or others in the chassis.

Handling

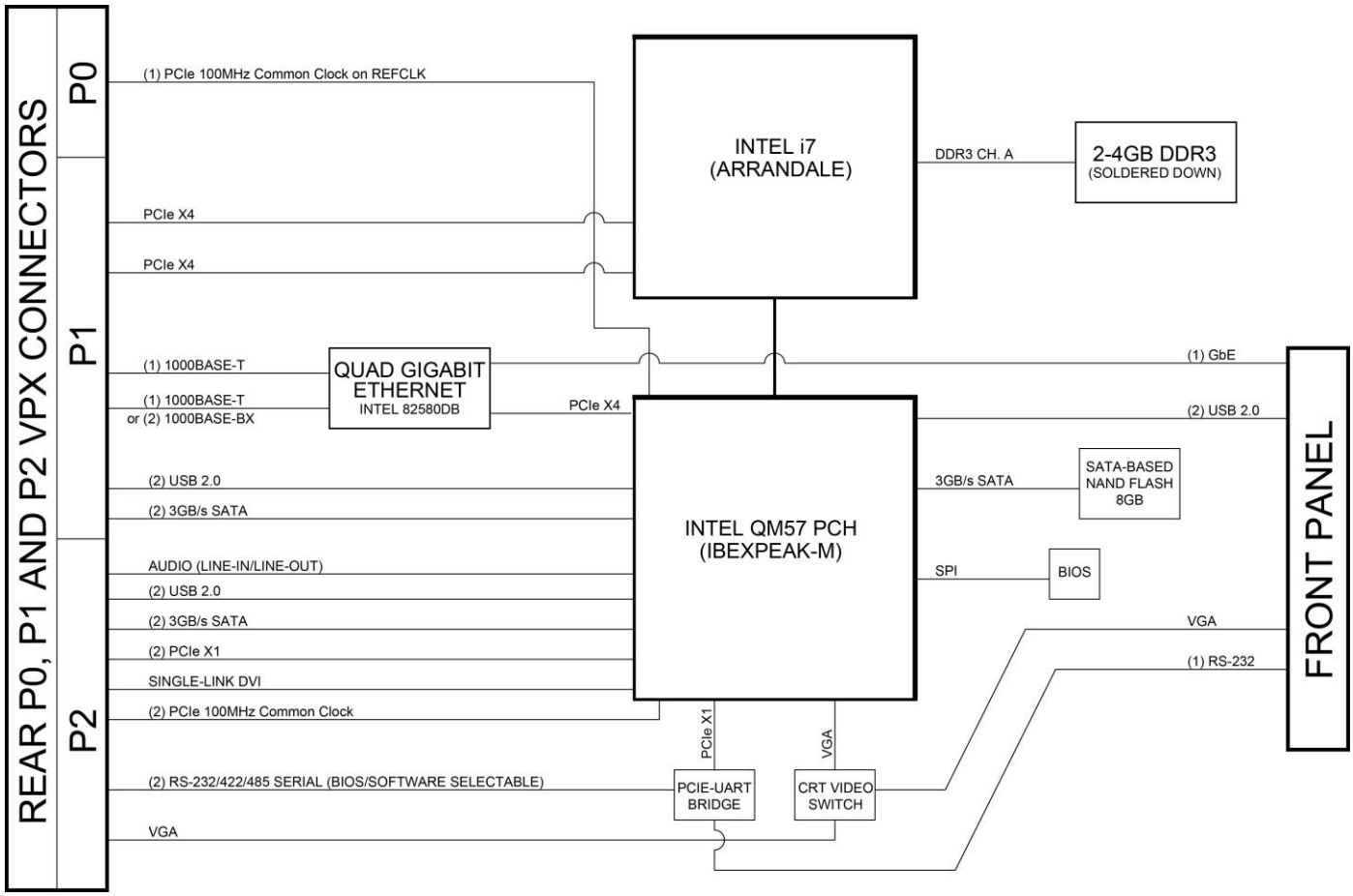
Modules should be handled in ESD-safe work areas in order to prevent damage to sensitive components from electrostatic discharges. These areas must be designed and maintained to prevent ESD damage.

ESD Safe Work Area Guidelines

1. Module should be handled at properly designated work areas only.
2. Designated ESD safe work areas must be checked periodically to ensure their continued safety from ESD. The areas should be monitored for the following:
    a. Proper grounding methods.
    b. Static dissipation of work surfaces.
    c. Static dissipation of floor surfaces.
    d. Operation of ion blowers and ion air guns.
3. Designated work areas must be kept free of static generating materials such as styrofoam, vinyl, plastic, fabrics or any other static generating materials.
4. Work areas must be kept clean and neat in order to prevent contamination of the work area.

5. Modules should be handled by the edges. Avoid touching the component leads.
   NOTE: *When not installed in a system, modules must be enclosed in shielded bags or boxes. There are three types of ESD protective enclosure materials this module was shipped in an approved ESD bag.*
6. Whenever handling the module the operator must be properly grounded by one of the following:
   a. Wearing a wrist strap connected to earth ground.
   b. Wearing heel grounders and have both feet on a static dissipative floor surface.
7. Stacking of modules should be avoided to prevent physical damage.

Operational Block Diagram



Architecture

CPU Chip

The Intel® i7 processors have a new micro-architecture, but remain software compatible with previous members of the Intel® microprocessor family. The Intel® Core™ i7-610E, 620LE and 620UE all contain two cores that can run independent processes, potentially doubling performance. With a maximum junction temperature of 105°C, the Intel® Core™ i7 processors are capable of withstanding a great deal of thermal stress. The 18 watt Intel® Core™ i7-620UE 1.06 GHz dual-core processors provide low power options and the 35W Intel® Core™ i7-610E 2.53GHz dual-core processors provide higher performance options.

Onboard Memory

SDRAM Memory

The XVPX-6300 is configured with 4GB of DDR3 memory, soldered down.

Flash BIOS

The XVPX-6300 system BIOS is contained in an 8MB flash device to facilitate system BIOS updates. Contact Xembedded support for available updates at support@xembedded.com if needed. Be sure to record your current version number and the reason for the request.

Ethernet Controller

An Intel 82580EB network controller provides 2 channels of 10/100/1000BaseT (Profile A), or one channel of 10/100/1000BaseT plus two channels of 1000base-BX (Profile B) Ethernet on the VPX P1 connector. This follows the Vita 46.6 specification for Gigabyte Ethernet over the backplane. On the Air Cooled version there is also one additional Ethernet port on the front panel.

Storage Devices

Onboard NANDFlash SSD

The XVPX-6300 features an onboard 8GB NANDFlash SSD. This SSD is attached via the SATA4 interface and available to operating systems as storage, or can have a bootable operating system installed on it.

Serial ATA connection via P1 and P2

The XVPX-6300 features four SATA-300 drive interfaces out the rear P1 and P2 VPX connectors. The use of the optional rear transition module (XVPX-9630) allows for the connection of two drives using standard SATA cables.

VPXbus Interface

The XVPX-6300 interface to VPXbus is via two PCIe x4 connections from the i7 directly to the VPX backplane on Fat Pipe A and Fat Pipe B.

Note

Due to a BIOS limitation, certain option cards containing Option ROMs connected to Fat Pipe B that are behind a PCIe switch, such as Xembedded models XVPX-9400 and XVPX-9425 may not boot properly. These cards will behave normally if connected to Fat Pipe A.

Serial Ports

The serial UART provides one Serial (RS-232) out the front (air cooled only) on the 26-pin cable and two serial ports out the back switchable from RS-232 to RS-422/485 by changing the value in the BIOS setup screen. Note: this setting affects both ports at the same time.

Real Time Clock

The RTC is part of the Intel QM57 device and is powered from the P3V3_AUX rail over the backplane or by the VPX VBAT supply. As long one of these is present, the system clock is maintained; if all power is removed, the RTC function is reset.

Environmental Specifications

Flammability

The circuit board is made by an UL recognized manufacturer and has a flammability rating of UL94V-1.

EMI/EMC Regulatory Compliance

Caution

This module generates, uses, and can radiate electromagnetic energy. It may cause, or be susceptible to EMI if not installed and used in a cabinet with adequate EMI protection.

The XVPX-6300 is designed using good EMC practices and, when used in a suitably EMC-compliant chassis, should maintain the compliance of the total system.

The XVPX-6300 also complies with EN60950 (product safety), which is essentially the requirement for the Low Voltage Directive (73/23/EEC).

Air-cooled build levels of the XVPX-6300 are designed for use in systems meeting VDE class B, EN and FCC regulations for EMC emissions and susceptibility.

Conduction-cooled and REDI build levels of the XVPX-6300 are intended for integration into EMC hardened cabinets/boxes.

I2C Bus and Temperature Sensor

There is one I2C bus to access the FRU (Field Replaceable Unit) which can store user data. This device will also report board temperature and status.

Caution

The XVPX-6300 requires air-flow of at least 200 LFM for the air-cooled version. If the conduction-cooled XVPX-6300 is operating on an extender card, it requires air-flow of at least 300 LFM across it. Versions using the REDI covers MUST NOT operate outside of a fully configured and fully installed conduction-cooled REDI system. With the covers installed conduction is the only cooling method.

ENVIRONMENTAL SPECIFICATION	OPERATING	NON-OPERATING
THERMAL *Air-cooled* 610E 620LE 620UE *Extended air-cooled* 610E 620LE 620UE *Conduction-cooled* All	*Air-cooled* 0° to 55°C[1] w/ 200 lfm airflow 0° to 65°C[1] w/ 200 lfm airflow 0° to 70°C[1] w/ 200 lfm airflow *Extended air-cooled* -20° to 60°C[2] w/ 200 lfm airflow -20° to 70°C[2] w/ 200 lfm airflow -20° to 75°C[2] w/ 200 lfm airflow *Conduction-cooled* -40° to 85°C[3] (measured at board/heatsink rail)	*Air-cooled* -40° to 85°C *Extended air-cooled* -40° to 85°C *Conduction-cooled* -55° to 105°C
HUMIDITY	20% - 80% RH, non-condensing	
SHOCK	30 g peak acceleration, 11msec duration	50 g peak acceleration, 11 msec duration
VIBRATION 5 - 2000 Hz	0.015” (0.38mm) peak-to-peak displacement, 2.5 g maximum acceleration	0.030” (0.76mm) peak-to-peak displacement, 5 g maximum acceleration
COMPLIANCE	VITA 46.4: PCIe x4 port; VITA 46.6: Dual Gigabit Ethernet ports; VITA 48: VPX REDI covers; and VITA 65: VPX System specs and practices	
FORM FACTOR	3U VPXbus 6.5” (165.1mm), .94” (100.1mm), .8” (20mm)	

[1]Designed to meet these temp specifications regardless of system utilization (without PMC/XMC installed). Lesser system utilization and/or higher airflow may allow higher operating temp, although in no case should 85°C be exceeded. CPU temp should be closely monitored for max junction temp of 105°C using a program such as Argus Monitor if exceeding the temps stated here.

[2]Every board tested to ensure these temp specifications regardless of system utilization (without PMC/XMC installed). Lesser system utilization and/or higher airflow may allow higher operating temp, although in no case should 85°C be exceeded. CPU temp should be closely monitored for max junction temp of 105°C using a program such as Argus Monitor if exceeding the temps stated here.

[3]Every board tested to ensure these temp specifications. Tested under Windows 7 with Passmark BurnInTest version 5.0, running CPU, Memory, and 3D Graphics tests simultaneously. During application testing CPU temp should be closely monitored for max junction temp of 105°C using a program such as Argus Monitor if exceeding measured rail temp of 70°C (thermocouple inside provided heatsink hole).

Hardware Specifications

CHARACTERISTIC	SPECIFICATION
POWER Intel® i7-610E Processor (8GB) Intel® i7-620LE Processor (8GB) Intel® i7-620UE Processor (4GB) All Processor Types	 +5V: 7.3A (typical); 11A (maximum) +5V: 5.9A (typical); 9.0A (maximum) +5V: 5.0A (typical); 7.6A (maximum) +3.3V: 3.1A (typical); 4.8A (maximum)
VOLTAGE	+3.3V: 3.25V - 3.45V +5V: +5%/-2.5%
CPU SPEED Intel® i7-610E Processor Intel® i7-620LE Processor Intel® i7-620UE Processor	 2.53 GHz, dual-core 2.0 GHz, dual-core 1.06 GHz, dual-core
ONBOARD MEMORY Intel® i7-610E or i7-620LE Processor Intel® i7-620UE Processor	 4GB single channel DDR3 ECC @ 1066 MHz 4GB single channel DDR3 ECC @ 800 MHz
GRAPHICS CONTROLLER	Intel® Integrated HD Graphics 2048 x 1536 max resolution, 32-bit color max (VGA) 1920 x 1200 max resolution, 32-bit color max (DVI-D)
ETHERNET CONTROLLER	Intel® 82580EB Quad Port Gigabit Ethernet

INTEGRATED SATA-300 CONTROLLER	SATA0, SATA1 via P1. SATA2, SATA3 via P2.
INTEGRATED NAND FLASH SSD	8GB on SATA4
STEREO AUDIO	IDT 92HD81Bx HDA CODEC Line Level Stereo Input and Output via P2
USB	Two USB 2.0 via front panel Two USB 2.0 via P1 Two USB 2.0 via P2
SERIAL PORTS	16550 compatible (3) Com 1 and Com2 via P2 (RS-232or RS-422/485 selectable) Com 4 via front panel connector (RS-232 only)
REGULATORY COMPLIANCE	European Union – CE;3 Electromagnetic Compatibility - 89/336/EEC RoHS Compliant

Build Levels

The XVPX-6300 is available in three electrically compatible build levels, each of which is carefully tailored to a particular set of requirements and environments. All three levels fully support the power and versatility of VPX, so no matter how large or diversified your project, absolute compatibility is assured at all stages of development. The three build levels have three basic mechanical configurations, both in accordance with the VITA 46.0 VPX standard and the Vita 48 REDI standard:

1. Air (convection) cooled modules are intended for use in standard industrial chassis.

2. Conduction-cooled modules are intended for use in sealed Air Transportable Racking (ATR) and other conduction-cooled environments.

3. REDI cover, Conduction-cooled modules are intended for use in sealed Air Transportable Racking (ATR) and other conduction-cooled environments.

Conduction-cooled modules include conformal coating as standard.

Ordering Information

XVPX-6300-ABCD-X	
A = THERMAL	1 – Air cooled
	2 – Conduction cooled
	3 – REDI covers
B = CPU	2 – i7-620UE
	3 – i7-620LE
	4 – i7-610E
C = MEMORY & CTRL PLANE	4 – 4GB with Profile A
	5 – 4GB with Profile B
D = EXTENDED TEMPERATURE	Blank – Standard temperature
	E – Extended temperature
X = SOLDER	L – Lead solder
	LF – Lead-free solder

PROFILE A: MOD3-PAY-2F2T-16.2.5-3 (Dual 1000BaseT Gigabit Ethernet)
PROFILE B: MOD3-PAY-2F2U-16.2.5-3 (Dual 1000Base BX & Single 1000BaseT Gigabit Ethernet)

Chapter 2 – Installation and Setup

Below is the outline of the XVPX-6300 showing the jumper locations. The module comes in a standard configuration which may not be compatible with your application. The following information will help you understand how to configure this module.

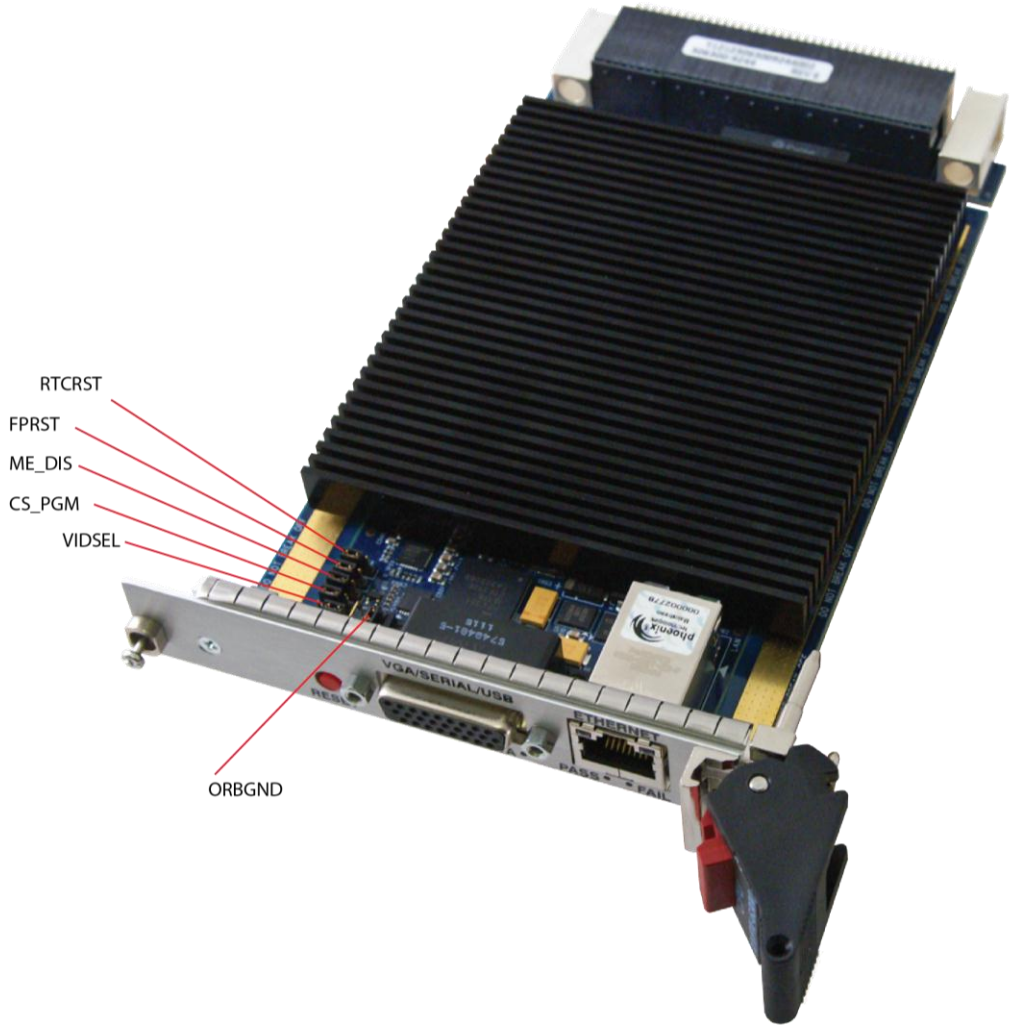


Fig. 2-1 shows the jumper locations on the XVPX-6300

Jumper Settings

The following section describes the XVPX-6300 jumpers with their default positions and functions.

CS_PGM	1-2 (default)	NORMAL OPERATION
	2-3	FACTORY USE ONLY

This jumper must be in the 1-2 position for normal operation. The XVPX-6300 will not boot with this jumper in 2-3 position.

FPRST	1-2 (default)	FRONT PANEL BUTTON RESETS SYSTEM (AND ALSO VPX IF SW1-3 IS ON)
	2-3	NO PUSHBUTTON RESET

In position 1-2, the front panel reset button will reset the XVPX-6300 and also reset the VPX interface if SW1-3 is ON.
In position 2-3, the front panel button will not cause any resets.

ME_DIS	1-2 (default)	NORMAL OPERATION
	2-3	FACTORY USE ONLY

This jumper must be in position 1-2 for normal operation. Position 2-3 is used when updating the ME Engine portion of the System Flash. Only use this position if instructed by Xembedded Support.

ORBGND Orb/Chassis Ground	1-2 (default)	FRONT PANEL TIED TO GND
	2-3	FRONT PANEL ISOLATED

RTCRST	1-2 (default)	NORMAL OPERATION
	2-3	CLEAR CMOS/RTC

To clear CMOS memory, briefly move this jumper to position 2-3. Be sure to move it back to position 1-2 before reapplying power.

VIDSEL	1-2 (air default)	VGA ON FPANEL CONN
	2-3 (conduction default)	VGA ON P2 CONN

In position 1-2, the VGA display is available on the front panel connector.
In position 2-3, the VGA display is available on the P2 connector.

Connectors

VPX Connectors

P0 Connector

P0 Wafer	A	B	C	D	E	F	G
1	+3.3 V	+3.3 V	+3.3 V	UNUSED	UNUSED	UNUSED	UNUSED
2	+3.3 V	+3.3 V	+3.3 V	UNUSED	UNUSED	UNUSED	UNUSED
3	+5 V	+5 V	+5 V	UNUSED	+5 V	+5 V	+5 V
4	NVRMO	SYSRESET#	GND	UNUSED	GND	UNUSED	UNUSED
5	SMB_DATA	SMB_CLK	GND	+3V3_AUX	GND	GA4#	GAP#
6	GA0	GA1	GND	UNUSED	GND	GA2#	GA3#
7	UNUSED	UNUSED	GND	UNUSED	UNUSED	GND	UNUSED
8	GND	UNUSED	UNUSED	GND	100M_ CLK0_P	100M_CLK0_N	GND

P1 Connector

P1 Wafer	A	B	C	D	E	F	G
1	PCIE0_RXP1	PCIE0_RXN1	GND	PCIE0_TXP1	PCIE0_TXN1	GND	GPO
2	GND	PCIE0_RXP2	PCIE0_RXN2	GND	PCIE0_TXP2	PCIE0_TXN2	GND
3	PCIE0_RXP3	PCIE0_RXN3	GND	PCIE0_TXP3	PCIE0_TXN3	GND	VBAT
4	GND	PCIE0_RXP4	PCIE0_RXN4	GND	PCIE0_TXP4	PCIE0_TXN4	GND
5	PCIE1_RXP1	PCIE1_RXN1	GND	PCIE1_TXP1	PCIE1_TXN1	GND	SYS_CON#
6	GND	PCIE1_RXP2	PCIE1_RXN2	GND	PCIE1_TXP2	PCIE1_TXN2	GND
7	PCIE1_RXP3	PCIE1_RXN3	GND	PCIE1_TXP3	PCIE1_TXN3	GND	UNUSED
8	GND	PCIE1_RXP4	PCIE1_RXN4	GND	PCIE1_TXP4	PCIE1_TXN4	GND
9	SATA0_RXP	SATA0_RXN	GND	SATA0_TXP	SATA0_TXN	GND	ENET0_LINK#

10	GND	SATA1_RXP	SATA1_RXN	GND	SATA1_TXP	SATA1_TXN	GND
11	USB_P1_P	USB_P1_N	GND	USB_P2_P	USB_P2_N	GND	ENET1_LINK#
12	GND	USB_5V_P1_P2	USB_5V_P1_P2	GND	USB_5V_P3_P4	USB_5V_P3_P4	GND
13	ENET0_P0_P	ENET0_P0_N	GND	ENET0_P1_P	ENET0_P1_N	GND	UNUSED
14	GND	ENET0_P2_P	ENET0_P2_N	GND	ENET0_P3_P	ENET0_P3_N	GND
15 (PROFILE A)	ENET1_P0_P	ENET1_P0_N	GND	ENET1_P1_P	ENET1_P1_N	GND	GPI
15 (PROFILE B)	SGMII_RX_P2_P	SGMII_RX_P2_N	GND	SGMII_TX_P2_P	SGMII_TX_P2_N	GND	GPI
16 (PROFILE A)	GND	ENET1_P2_P	ENET1_P2_N	GND	ENET1_P3_P	ENET1_P3_N	GND
16 (PROFILE B)	GND	SGMII_RX_P1_P	SGMII_RX_P1_N	GND	SGMII_TX_P1_P	SGMII_TX_P1_N	GND

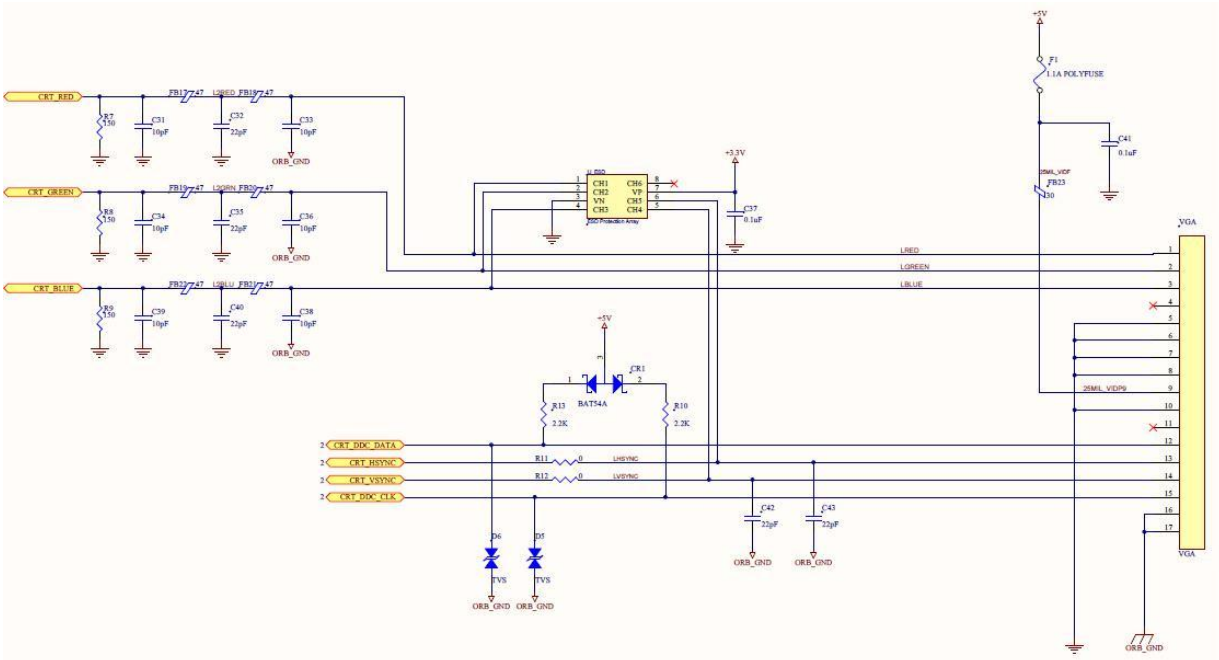
P2 Connector

P2 Wafer	A	B	C	D	E	F	G
1	AUD_LINEIN_L	AGND_AUDIO	GND	AUD_LINEOUT_L	AGND_AUDIO	GND	CRT_RED
2	GND	AUD_LINEIN_R	AGND_AUDIO	GND	AUD_LINEOUT_R	AGND_AUDIO	GND
3	AUD_SENSE_B	AGND_AUDIO	GND	GND	GND	GND	CRT_GRN
4	GND	USB_P3_P	USB_P3_N	GND	USB_P4_P	USB_P4_N	GND
5	DVI_P0_P	DVI_P0_N	GND	DVI_P1_P	DVI_P1_N	GND	CRT_BLU
6	GND	DVI_P2_P	DVI_P2_N	GND	CLK_DVI_P	CLK_DVI_N	GND
7	DVI_SDA	GND	GND	DVI_SCL	GND	GND	CRT_VSYNC
8	GND	DVI_HPD	GND	GND	UNUSED	GND	GND
9	COM1_TX	COM1_422/485_TX-	GND	COM1_RX	COM1_422/485_RX-	GND	CRT_HSYNC
10	GND	COM2_TX	COM2_422/485_TX-	GND	COM2_RX	COM2_422/485_RX-	GND
11	SATA2_RXP	SATA2_RXN	GND	SATA2_TXP	SATA2_TXN	GND	CRT_DATA
12	GND	SATA3_RXP	SATA3_RXN	GND	SATA3_TXP	SATA3_TXN	GND
13	PCIE1_RXP	PCIE1_RXN	GND	PCIE1_TXP	PCIE1_TXN	GND	CRT_CLK
14	GND	PCIE2_RXP	PCIE2_RXN	GND	PCIE2_TXP	PCIE2_TXN	GND
15	100M_CLK1_P	100M_CLK1_N	GND	100M_CLK2_P	100M_CLK2_N	GND	PLT_RST#
16	GND	CLKREQ_CLK1#	GND	GND	CLKREQ_CLK2#	GND	GND

P2 I/O Signal Requirements

This section provides the information necessary to interface with the P2 I/O signals, without using a XVPX-9630 RTM module.

VGA: For proper operation of the VGA display, 150ohm termination to GND is required on the CRT_ RED, CRT_ GRN and CRT_BLU signals. Failure to apply this termination may result in poor display quality and improper operation of Intel® HD Graphics control panel in Windows®. Also for proper monitor detection, the CRT_CLK and CRT_DATA lines should be level shifted to +5V. See the following for suggested interface schematic:



It is strongly suggested that ESD protection be included in interface circuitry on the VGA and USB ports. Failure to do so may cause damage the XVPX-6300 in the event of an ESD discharge into the I/O pins.

FPANEL

The FPANEL connector ports (USB1, USB2, COM4 and VGA) can be accessed through standard connectors by using the supplied FPANEL dongle cable (P/N 201157). Note that the DB-9 serial connector on this dongle cable is wired as a DTE port.

1	GND
2	USB Port 0 +
3	USB Port 0 -
4	GND
5	+5V USB POWER
6	VGA DDC DATA
7	VGA RED
8	VGA GREEN
9	VGA BLUE
10	GND
11	USB Port 1 +
12	USB Port 1 -
13	GND
14	+5V VGA POWER
15	VGA DDC CLK
16	GND RED
17	GND GREEN
18	GND BLUE
19	COM4 CTS#
20	COM4 RTS#
21	COM4 DSR#
22	COM4 DTR#
23	COM4 TXD
24	COM4 RXD
25	VGA VSYNC
26	VGA HSYNC

Front Panel Layout

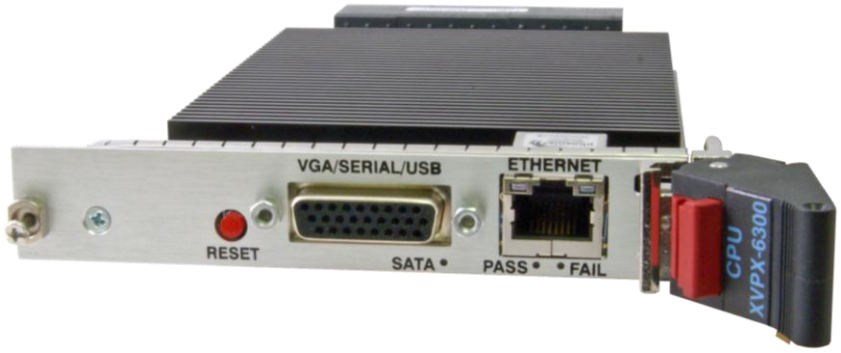


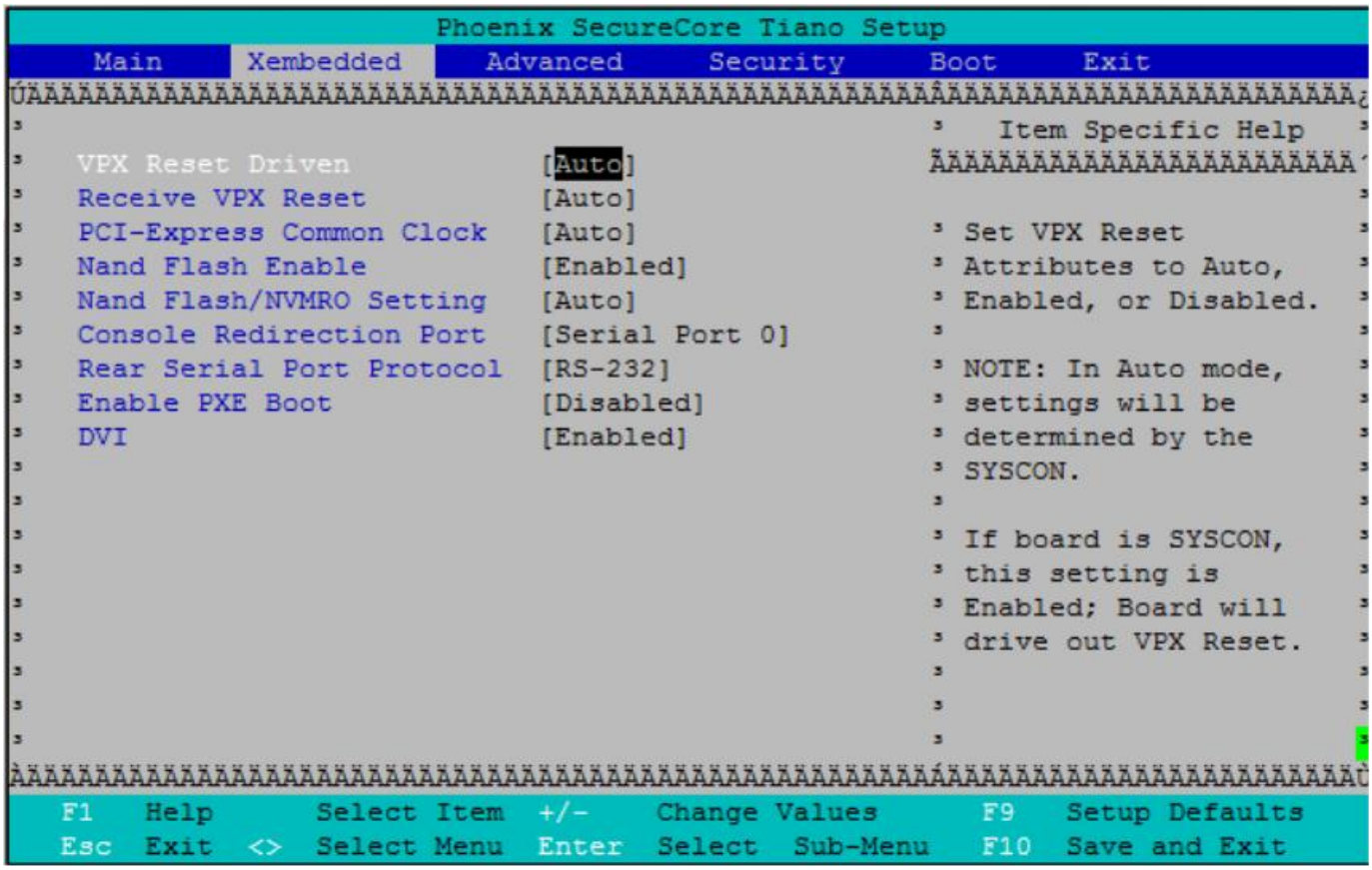
Fig. 3-1 shows an air-cooled front panel

Front Panel LEDs and Reset Switch

The reset switch can be configured in the BIOS to either reset the XVPX-6300, or to reset both the VPXbus and the XVPX-6300. The green pass and red fail LEDs are used as an indication of board health during the BIOS boot up. As the BIOS starts the POST, the red fail LED will be turned off. When the BIOS completes POST, the green PASS LED is turned on.

Software Programmable Features

There are several BIOS programmable features available in the Xembedded section of the BIOS setup:


Phoenix SecureCore Tiano Setup
Main
Xembedded
Advanced
Security
Boot
Exit
Item Specific Help
VPX Reset Driven [Auto]
Receive VPX Reset [Auto]
PCI-Express Common Clock [Auto]
Nand Flash Enable [Enabled]
Nand Flash/NVMRO Setting [Auto]
Console Redirection Port [Serial Port 0]
Rear Serial Port Protocol [RS-232]
Enable PXE Boot [Disabled]
DVI [Enabled]
Set VPX Reset Attributes to Auto, Enabled, or Disabled.
NOTE: In Auto mode, settings will be determined by the SYSCON.
If board is SYSCON, this setting is Enabled; Board will drive out VPX Reset.
F1 Help Select Item +/- Change Values F9 Setup Defaults
Esc Exit <> Select Menu Enter Select Sub-Menu F10 Save and Exit

VPX RESET Driven

Enabled: Local XVPX-6300 i7 PLT_RESET# drives VPX SYS_RESET#
Disabled: Local XVPX-6300 i7 PLT_RESET# does not drive VPX SYS_RESET#
Auto: Determined by state of VPX SYS_CON# pin
SYS_CON# = LOW: Enabled
SYS_CON# = HIGH: Disabled

Receive VPX RESET

Enabled: VPX SYS_RESET# will reset the XVPX-6300
Disabled: VPX SYS_RESET# will not reset the XVPX-6300
Auto: Determined by state of VPX SYS_CON# pin
SYS_CON# = LOW: Disabled
SYS_CON# = HIGH: Enabled

PCI-Express Common Clock

Enabled: Drives out 100MHZ clock on VPX P0 REFCLK pins
Disabled: Does not drive out 100MHZ clock on VPX P0 REFCLK pins
Auto: Determined by state of VPX SYS_CON# pin
SYS_CON# = LOW: Enabled
SYS_CON# = HIGH: Disabled

NAND Flash Enable

Enabled: Onboard 8GB NANDFlash SSD is enabled for use
Disabled: Onboard 8GB NANDFlash SSD is disabled and cannot be used

NAND Flash/NVMRO Setting

Read/Write: Onboard 8GB NANDFlash SSD operates normally in read/write mode
VPX NVMRO signal is driven low to the rest of the system
Read Only: Onboard 8GB NANDFlash SSD operates in 'dummy write' mode. Any writes in this mode appear to be written, but are gone after a power-cycle VPX NVMRO signal is not driven
Auto: Determined by state of VPX SYS_CON# pin
SYS_CON# = LOW: Read/Write
SYS_CON# = HIGH: Read Only

Console Redirection Port

Serial Port 0: COM1 on P2 connector
Serial Port 1: COM2 on P2 connector
Serial Port 3: COM4 on FPANEL connector

Rear Serial Port Protocol

RS-232: COM1 and COM2 on P2 connector use RS-232 protocol
RS-422/485: COM1 and COM2 on P2 connector use RS-422 or RS-485 protocol

Enable PXE Boot

Enabled: Enables boot from LAN
Disabled: Disables boot from LAN

DVI

Enabled: Enables DVI port on P2 connector
Disabled: Disables DVI port on P2 connector

CPU Turbo Mode

The Intel i7 processors have a Turbo Mode feature that is essentially an 'on-demand' overclocking mechanism that can run the CPU temporarily faster than the maximum rated CPU frequency when both cores of the CPU are not 100% utilized. This mode of operation results in large instantaneous dynamic swings in power supply current. As a result, spurious resets of the board may be experienced with Turbo Mode enabled if the power supply and/or backplane combination are insufficient.

Turbo Mode can be enabled/disabled in the BIOS setup. It can be found in the Advanced > Thermal Configuration screen.

Note

With Turbo Mode enabled a power supply and/or backplane combination incapable of supplying large instantaneous current surges may result in spurious resets of the board.

Installation

The XVPX-6300 can connect to other cards on the VPX bus through two Fat Pipes (PCIe x4), but also supports smaller link widths.

Review the Safety Notices section before installing the board. The following notices also apply:

Caution

The XVPX-6300 has been specifically designed for use with 3U VPX backplanes and may not be compatible with some 6U backplanes. Plugging the board into an unsupported 6U VPX backplane may cause permanent component damage.

Consult the enclosure documentation to ensure that the XVPX-6300's power requirements are compatible with those supplied by the backplane.

Board Keying

The 3U VPX backplane specification requires all backplane slots to have two guide pins: one above the J0 connector and one below the J2 connector. As well as providing correct alignment, these pins are keyed to prevent cards from being inserted into incorrect backplane slot(s) to avoid electrical incompatibility.

The XVPX-6300 has receptacles for these guide pins (see the Connectors section). By default, these are not keyed. Please contact the factory to discuss keying requirements.

Installation Notes

1. Keying may dictate the backplane slot(s) into which the XVPX6300 can be inserted.
2. Air-cooled versions have an ejector handle to ensure that the backplane connectors mate properly with the backplane. The captive screws at the top and bottom of the front panel allow the XVPX-6300 to be tightly secured in position, which provides continuity with system chassis ground.
3. Conduction-cooled and REDI versions have screw driven wedge locks at the top and bottom of the board to provide the necessary mechanical/thermal interface. Correct adjustment requires a calibrated torque wrench set to between 0.6 and 0.8 Nm.
4. In an air-cooled development enclosure, when making I/O connections from the backplane connectors, use of Xembedded's RTM modules (or some equivalent system) ensures optimum operation with regard to EMI.

Chapter 3 – Accessory Modules

XVPX-9630

The optional XVPX-9630 Rear Transition Module is used for easy interfacing to the XVPX-6300's P1 and P2 I/O. The base board contains a standard 15-pin VGA, 2 standard USB 'A', 2 standard 7-pin SATA, and 5-pin audio. PIM modules are used to add additional connectors. Standard and Custom PIMs are available.

Fig. 4-1 shows the XVPX-9630-101

The following configurations are available:

XVPX-9630-100	*Rear Transition Module with VGA, (2) USB, (2) SATA, Serial, audio, and SMBUS*
XVPX-9630-101	*Same as XVPX-9630-100 plus Ethernet, (2) SATA, and 3-pin RS-232*
XVPX-9630-102	*Same as XVPX-9630-100 plus Dual Ethernet and 3-pin RS-232*
XVPX-9630-103	*Same as XVPX-9630-100 plus DVI and 3-pin RS-232*

Jumpers

The XVPX-9630 only has one jumper setting, ORB (front panel) ground:

ORBGND	1-2 (default)	ORB GND TIED TO DIGITAL GND
	2-3	ORB GND ISOLATED

Connectors

This section provides pin outs for some of the XVPX-9940 connectors. Refer to the EMC warning at the beginning of this manual before attaching cables.

AUDIO

1	LINE OUT LEFT
2	LINE OUT RIGHT
3	GROUND
4	LINE IN LEFT
5	LINE IN RIGHT

FPANEL

The FPANEL connector ports (USB1, USB2, COM1 and VGA) can be accessed through standard connectors by using the supplied FPANEL dongle cable (P/N 201157). Note that the DB-9 serial connector on this dongle cable is wired as a DTE port.

1	GND
2	USB Port 0 +
3	USB Port 0 -
4	GND
5	+5V USB POWER
6	VGA DDC DATA
7	VGA RED
8	VGA GREEN
9	VGA BLUE
10	GND
11	USB Port 1 +
12	USB Port 1 -
13	GND
14	+5V VGA POWER
15	VGA DDC CLK
16	GND RED
17	GND GREEN
18	GND BLUE
19	COM1 422/485 RX-
20	COM1 422/485 TX-
21	NC
22	NC
23	COM1 TX
24	COM4 RX
25	VGA VSYNC
26	VGA HSYNC

Battery

The XVPX-9630 can supply VBAT power to the XVPX-6300 and the rest of the VPX chassis by installing a standard BR1225 or CR1225 coin cell. Please ensure there is not another source of VBAT in the chassis before installing the coin cell in the XVPX-9630.